Gleitsmann (J. W.)

# Deviation of the Nasal Septum.

BY

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# DEVIATION OF THE NASAL SEPTUM.

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Instructor in the New York Polyclinic, and Surgeon to the German Dispensary, Throat and Ear Department, New York.

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Although the introduction of the laryngoscope nearly thirty years ago rapidly developed a new era in the diagnosis and treatment of diseases of the larynx, it is a much shorter time since greater attention is being paid by specialists to affections of the nose and its adjacent parts. The importance of rhinology cannot well be over-estimated when we consider the different functions the nose is performing in the human economy. The upper part of the nasal cavity, the olfactory region, presides over the sense of smell, whilst the lower one, the respiratory region, is the normal way for the air during the act of respiration. Interference with this natural channel leads to mouth-breathing with its manifold subsequent evils. When the air passes through the nose, it is not only cleansed and moistened, but it also reaches the lungs much warmer than when breathing is going on by the mouth. Nasal respiration with closed lips further exerts a negative pressure of two to four milligrammes mercury in the oral cavity,[1] by which the tongue is drawn to the hard palate, and the muscular action, maintaining the position of the lower maxilla, greatly assisted. The nose also acts the part of a resonant chamber for the human voice, and nasal obstruction imparts to it the so-called dead character described in Meyer's paper on adenoid vegetations. Finally, it is due to the anatomical relations of the nose to the eye and ear that cases of catarrhal conjunctivitis, lachrymal fistula, frequently only heal when coexisting nasal affections are relieved, and that the latter are, in an overwhelming number of instances, productive of aural disease often of the severest kind. Aside from the symptoms of nasal stenosis in a greater or less degree, deviations of the septum are apt to cause disfigurement of the face, and also have some relation to the bony structures of the head, which will be explained below.

[1] Mezger and Donders, Pflüger's Archiv für Physiologie, vol. x. 1875, pp. 89–94.

*Pathology.*—Our subject has till of late been rather neglected by medical writers, and even some recent text-books do not treat it with the attention it deserves. The nasal septum is formed of an osseous, a cartilaginous, and a membranous part; the components of the osseous septum being the vomer, the perpendicular plate of the ethmoid bone, and the crista nasalis of the upper maxilla and of the palate bones. The deviations occur on the anterior two-thirds of the septum; the posterior part of the vomer has always been found straight, with the exception of a case of different diameters of the choanæ mentioned by Gruber.[1] Welcker[2] also saw a difference in height of the two choanæ 13 times in 37 skulls, with deflection of the nasal bones. Other anomalies of the vomer posteriorly, as *f. i.*, its vertical division in two halves (Lefferts); its extension backwards to the pharyngeal wall dividing the nasopharynx into two lateral halves (J. N. Mackenzie, Major) do not strictly belong to our chapter.

Deviations of the septum are so frequent that a perfectly straight septum is more the exception than the rule. Although they had been described over a century ago, Theile[3] was the first to publish statistics. He found in 117 crania 88 asymmetrical positions (73 per cent.), 41 deflections to the right, 45 to the left, twice a sigmoid-shaped inclination. Semeleder[4] saw, in 49 skulls, the septum bent to the left 20, to the right 15, sigmoid twisted 4 times (79 per cent.). Allen[5] met with narrowing of the left side 19, of the right 21 times in 58 skulls (69 per cent.), 6 of which exhibited contact between the superior and middle turbinated bones and the septum. Zuckerkandl's[6] examination of 370 crania showed 123 symmetrical and 140 asymmetrical positions of the septum; of the latter 57 inclinations to the right, 51 to the left, and 32 sigmoid shaped. Loewenberg's[7] proportion was 1 perfectly straight septum in 7 cases. The merit of having made the investigation of our subject on the largest scale and with the minutest accuracy is due to Mackenzie,[8] who examined 3102 skulls, 2152 of which had the septum sufficiently preserved to be tested. He found deviation in 1657 cases (76.9 per cent.), the average deflection being 4 millimetres; the greatest degree being 9, the least half a millimetre; septa with still lower curvature being counted straight. The inclination was towards the right side 609 (28.2 per cent.), to the left 838 (38.9 per cent.); sigmoid in character 205 times (9.5 per cent.); in 5

[1] Gruber, W., Virchow's Archiv für Pathologische Anatomie, vol. lxx., 1877, p. 136.

[2] Welcker, H., Asymmetrien der Nase, in Beiträge zur Biologie, Stuttgart, Cotta, 1882, p. 323; also reprint.

[3] Theile, Zeitschrift für rationelle Medizin, 1855, neue Folge, vol. vi. p. 242.

[4] Semeleder, F., Die Rhinoscopie, Leipzig, Engelmann, 1862, p. 64.

[5] Allen, H., American Journal of the Medical Sciences, January, 1880, p. 70.

[6] Zuckerkandl, E., Anatomie der Nasenhöhle, etc., Wien, Braumüller, 1882, p. 45.

[7] Loewenberg, B., Archives of Otology, 1883, vol. xii. No. 1.

[8] Mackenzie, M., Manual of Diseases of the Throat and Nose, London, Churchill, 1884, vol. ii. p. 432.

cases the septum was of "zigzag" type. The preponderance of the left side being the narrower one, although perhaps not as prevalent as generally assumed, is from the foregoing evident. The slight discrepancies of the investigators in regard to the percentage, probably resulted from the different methods adopted in determining the minor degrees of deviation. Europeans are generally more predisposed to the abnormity than other races, so Allen (*l. c.*) found in 93 skulls of negroes 21.5 per cent.; Zuckerkandl (*l. c.*) in 103 crania of non-European 23 per cent. deflection; whilst, according to Mackenzie (*l. c.*), of 438 symmetrical septa only 22.6 per cent. were from Europeans.

Curvature of the septum is often complicated with two anomalies, which, although not forming an essential part of it, are liable to aggravate already present mischief, and ought not to be lost sight of in the treatment. The first one is the presence of bony ridges, running along the septum and generally found on its convex side. When large and located at the lower part, they encroach upon the lower turbinated bone; when higher up, they press against the middle turbinated, obliterating the middle meatus and blockading the entrance to the antrum Highmori. The second anomaly has been described by Delavan[1] to consist in a hypertrophy of the middle turbinated bone in the otherwise spacious concave part of the nose, and occurring 11 times in 18 cases of deflection of the septum. This hypertrophy naturally interferes with the patency of the wider nostril, and the removal of the bone in such cases is advocated before operating upon the deflection.

The deviations thus far spoken of refer only to the osseous structure of the septum, but, as the cartilage alone is often bent, the percentage during life is still greater. Any or all parts of the septum can participate in the deflection, and there are cartilaginous, osseo-cartilaginous, and osseous deviations; the latter occurring in the perpendicular plate of the ethmoid bone, at the ethmo-vomerine suture, in the vomer and in the crest of the upper maxilla. .

The configuration and location of the deformity have induced several writers to make different subdivisions, in which each one seemed to be guided more by his personal experience and observation than by a strict anatomical investigation on an uniform basis. Thus Loewenberg (*l. c.*) distinguishes horizontal, vertical, and irregular deviations, of which the first can again be superior and inferior. Ingals[2] divides the cases into four classes, whilst Mackenzie[3] enumerates six varieties for the cartilaginous part alone. In the opinion of the writer the most satisfactory explanation of the anatomical relations of septal deviations has been given

[1] Delavan, D. B., Archives of Laryngology, 1882, vol. iii. No. 3.

[2] Ingals, E. F., Archives of Laryngology, 1882, vol. iii. No. 4.

[3] Mackenzie, J. N., Deflection of the Nasal Septum, reprint from Transactions of Medical Society of Virginia, 1883.

by Welcker,[1] whose highly interesting studies, with the exception of one quotation in Mackenzie's Manual, could not be found alluded to in English treatises, and to which to refer at some length may for this reason be justifiable.

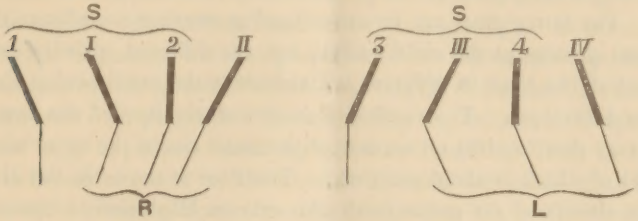
Welcker began his researches with the examination of his collection of 666 crania, which was supplemented by another of 78 plaster casts at the Institute for Comparative Anatomy at Leipzig. He made a selection of skulls, showing decided deflection of the nasal bones from the median line, and it became at once evident that two principal distinctions had to be made: one in which the cartilaginous part deviates in the opposite direction from the ridge of the nose (scoliotic noses graphically represented ·)·); the other in which both parts form one continuous oblique line (noses deviating in toto to one side, thus ·\·). The direction of the nasal bones, however, is no criterion for the deflection of the lower part and the tip of the nose, and the apertura pyriformis with its boundaries, especially the maxillar crest, is the deciding point. Welcker always found with but one exception a peculiar shape of this aperture in pronounced deviation of the nasal bones from the vertical line, and calls skulls with this abnormity *pteleorrhinal*, because resembling the shape of the elm leaf. The anomaly consists in asymmetry of the sides, one being wider horizontally and shorter in its vertical diameter; the other being narrower and longer vertically, lessening when excessive, proportionately the height of the palatine process of the upper maxilla. The salient feature is that the anterior edge of the vomer and the maxillar crest, both of which support the quadrangular cartilage, always deviate from the narrower and deeper cut-out side towards the wider and shallower side of the aperture. As further the deflection of the nasal bones coincides in different skulls, with the narrower as well as the wider side of the pyriform aperture, four main classes of deviations are to be distinguished. We, therefore, have skulls with I. deviation of the nasal bones to the left, and of the anterior edge of the vomer and the maxillar crest to the right; II. nasal bones, vomer edge, and crest to the right; III. nasal bones to the right, vomer edge and crest to the left; IV. nasal bones and crest to the left, number I. and III. representing scoliotic, II. and IV. *in toto* deviating noses.

The deductions which Welcker drew from his investigation, and which he afterwards substantiated by his examination of casts, are summarized as follows: Asymmetry of the orbits often accompanies deflection of the nasal bones in the higher degrees of which the orbit is generally longer in its transverse diameter on the deflected side. Further, the plane of the pteleorrhinal aperture inclines from the median line of the skull towards the wider and shallower side of the aperture. All these skulls have a bent vomer, and its curvature is always found on the narrower, deeper side of

[1] Welcker, H., l. c., pp. 337–349.

the aperture, from which the above plane and with it the tip of the nose diverges. The same direction as stated above is taken by the anterior end of the maxillar crest and of the vomer because the latter will be inclined, *f. i.*, towards the right anteriorly when bent towards the left posteriorly.

It is obvious that there are many cases of septal deviation in which even painstaking scrutiny cannot detect deflection of the nasal bones from the median line. But from the accompanying schematic drawing it will not be difficult to show how such and other instances of deviation can be arranged under the four headings previously named—




The darker line represents the osseous ridge of the nose, whilst the lower finer line stands for the cartilaginous parts. The four Roman letters correspond, as is readily seen, to the four chief groups, the six forms under letter S are scoliotic noses, two of which in addition to the noses deviating *in toto* will have the tip turned to the right (R) or left (L) respectively. As numbers 1 and 3 are less frequent, also approach the configuration of I. and III., and as numbers 2 and 4 play only a subordinate part, we can in the main distinguish noses deviating I. to the left-right, II. to the right, III. to the right-left, IV. to the left. With this designation tallies the common usage with perhaps the one exception, that if the osseous part is strongly deflected, *f. i.*, to the left, but the tip only slightly to the right, the nose is generally called bent to the left, whilst here it is classified under number I. with deflection to the right.

In Welcker's examination of skulls only such presenting exquisite deviation of the nasal bones, 37 out of the whole number of 666 were selected, whilst in that of the plaster casts 44 out of 78, also such with minor degrees of deviation were made use of. As the writer could not find any corroboration of Welcker's researches in the literature the subject was considered of sufficient importance to test his assertions. The investigation, in which I had the valuable help of my assistant, Dr. Hubbard, had naturally to be made on a smaller scale, as the museums of our three universities contained only 268 skulls in sufficient state of preservation to be available for our purpose. Furthermore, the crania in the Museum of the University of the City of New York could not be removed from the glass cases on account of legal proceedings, and therefore not as carefully

examined as was desirable. The result was that we found 20 skulls showing decided deflection of the nasal bones, which is a trifle higher percentage than Welcker's (7.0 to 5.5), and, to be short, that we could only verify his statements in every particular. In group I. we saw three, in group II. nine, in III. four, and in IV. four crania, corresponding in all details with the description in the foregoing pages.

*Etiology.*—In regard to the etiology opinions are divided up to the present time. Whilst formerly there was a tendency to consider almost all deviations congenital the opposite view seems now to gain ground (*f. i.*, Ziem, Bresgen). There can be but little doubt that acquired as well as congenital causes are important factors in the production of our disease. The latter must not be understood as causing a malformation of the septum present at the child's birth, but the different growth and development of the head in different individuals is the predisposing element for future deflections. The vertical diameter of the face of the new-born child is very short mainly on account of the small size of the upper maxilla, the height of which is about one inch.[1] The floor of the orbit lies directly above the alveolæ of the molar teeth, the antrum Highmori is represented by a small pouch on the anterior end of the middle nasal meatus, and does not form before the fourth month. The cribriform and perpendicular plates of the ethmoid bone are still cartilaginous; the latter begins to ossify towards the middle of the first year. The vomer is formed in the third month of intrauterine life by two ossifying plates, between which the original septal cartilage remains, often not disappearing before the thirtieth or fiftieth year.

According to experiments of Fick (see Henke) who removed large pieces of the septum in animals, their snout grew in an upward direction, which shows that it had been kept down by pressure of the septum from above downwards. The nasal septum is destined to serve as a prop, pushing apart the upper maxilla from the base of the skull, and its growth will be greatly influenced by the maxillar palatine process, the shape of which again is in a measure dependent on the development of the Highmore's cavity. A high-pitched and narrow palatine arch naturally encroaches upon the growth of the septum in a vertical direction, and consequently often associates with septal deflection. The adherents of the view that all deviations are acquired (Ziem[2]) explain this observation by stating the primary cause to be in the septum and not in the palate. But it will be difficult to establish always a preceding lesion of the septum and to make it accountable for a subsequent abnormal palatine curvature. Further-

[1] Henke, W., Gerhard's Handbuch der Kinderkrankheiten, Tübingen, Laupp, 1877, vol. i. p. 250 *et seq.* See also Watson, Diseases of the Nose, pp. 22 and 23. London, 1875.

[2] Ziem, Monatsschrift für Ohrenheilkunde, etc. 1883, No. 4.

more, Jarvis[1] recently referred to this configuration as occurring in four members of one family, father and three sons, which tends to indicate a hereditary predisposition to this palatine anomaly with the accompanying septal deviation.

In this connection attention may be drawn to the investigation by Virchow of the development of the base of the skull.[2] He found a slight convexity upwards of the base in the new-born child, and calls it kyphosis of the base of the skull analogous to the curvatures of the spinal column. Marked kyphosis is complicated with diminished length of the cranial base and protrusion of the maxilla and teeth (Prognathy), whilst a straighter and longer base is associated with receding of the anterior part of the maxilla from the plane of the forehead and nose (Orthognathy). It is not impossible that orthognathy, which is prevalent in the Caucasian race, may bear some relation to the greater frequency of septal deviations in Europeans in comparison with prognathic races, and this supposition, although merely proffered as a hypothesis awaiting proof or denial by future researches, seems to be corroborated by the absence of nasal deflection in animals.

Congenital influence does not seem to develop septal deviation before the child arrives at a certain age. Zuckerkandl saw none before the seventh, Welcker none before the fourth year. Trauma is generally the cause of acquired deflection, and occurs already in early infant life, *f. i.*, injuries to the septum during difficult parturition. Blows, falls on the nose are very frequent, and often not remembered in later years. It is claimed by some writers that the habit of putting the fingers into the nose—by others, that the constant use of the pocket-handkerchief with one hand—bring on the deformity. Welcker (*l. c.*) propounds the theory that sleeping on one side accounts for nasal deflection to the other, which, conceded in regard to noses deviating *in toto* (see above number II. and IV.), gives no satisfactory explanation of the origin of scoliotic noses. Some deflections are due to tumors, fibrous polypi, etc.

*Symptomatology.*—Many cases of septal deviation, especially those of minor degrees, produce no symptoms whatever, whilst others cause not only an unsightly deformity, but are followed also by very annoying and sometimes grave consequences. Pronounced inclination of the nasal bones to one side interferes with the symmetrical aspect of the face, and in some instances also with the functions of the eye on account of the longer transverse diameter of the orbit. Anomalous curvature of the orbit determines anomalous curvature of the eye in its different meridians and astigmatism has been observed conjointly with asymmetry of the face.

The local symptoms are mainly those of nasal stenosis, including mouth-

[1] Jarvis, Wm. C., New York Medical Record, March 14, 1885.

[2] Virchow, R., Untersuchungen über die Entwicklung des Schädelgrundes, p. 60 *et seq.* Berlin, Reimer, 1857.

breathing, which have been so ably discussed by Roe,[1] Major,[2] and others, as not to necessitate a lengthy description here. Be it only briefly stated, that aside from almost always present nasal catarrh, all the functions of the nose alluded to are liable to become affected. The sense of smell may be diminished or lost entirely (already observed by Rupprecht, Aerztliche Intelligenzblatt, No. 14, 1867). Habitual mouth-breathing changes often not only the expression of the face, but causes also catarrhal affections of the pharynx and larynx, and in some cases is held accountable for development of pigeon-breast in children. The nasal twang of the voice has already been mentioned. As to the ear the whole array of symptoms from altered atmospheric pressure in the middle ear to otitis media with perforation of the tympanum and subsequent deafness can occur. Frontal headache, epiphora, even dropsy of the antrum have been observed, due to occlusion of the maxillar sinuses and the lachrymal duct.

Although at first sight it would appear that symptoms of nasal stenosis are less aggravated in septal deviations on account of greater patency of the opposite nostril, there are several elements interfering with free respiration through the latter. The law of compensation, which we notice in some organs, does not apply to the nose. The one nostril does not grow wider when the other is impermeable. Further, the greater patency of the unobstructed nostril is often the cause of catarrhal conditions in consequence of the feebler air-current and more difficult voluntary removal of secretion (J. N. Mackenzie). The frequent occurrence of hypertrophy of the middle turbinated bone on the wider side has already been referred to. Finally, sigmoid-shaped deviations may completely block up both nostrils.

Rhinoscopic examination will easily disclose the nature of the disease, although sometimes the diagnosis of polypi has erroneously been made. Thickening of the septum, simulating deflection, can, if not by ocular comparison of both sides, very well be determined by Seiler's[3] septometer, the index of which states the thickness of the tissue grasped between the calipers.

*Treatment.*—The devices for the relief of nasal deviation are so manifold and so well described by their different exponents, that a short statement will suffice for our purpose. One of the oldest methods is the removal of the projecting part by the excising nasal forceps, one blade of which is introduced opposite the obstruction, and the forcep, when closed, acts like the ticket-punch of the railroad conductors. Blandin[4] introduced this operation, but did not publish the result of the case. Subsequent

[1] Roe, J. O., New York Medical Record, April 30, 1881.

[2] Major, G. W., ibid., November 22, 1884.

[3] Seiler, Carl, Diseases of the Throat, Philadelphia, Lea's Sons & Co., 1883, p. 83.

[4] Blandin, in Denonvillier's Compendium de Chirurgie pratique. Paris, Asselin, 1852–61, tom iii. p. 33.

modifications of the instrument were described by Rupprecht,[1] Goodwillie,[2] Roberts,[3] and others. This proceeding answers in many cases, and gives relief to the patient by creating a passage of air through the nose, and is also to be considered when time is an object, as it is quickly performed. But it has some drawbacks, which must not be overlooked. Although the part excised is not large enough to deprive the nose of its support, the purposes of the septum are best observed by retaining its integrity. The wound is slow to heal, especially in scrofulous subjects, the nasal secretions collect and dry on its edges, and are apt to induce scabbing and soreness. When the opening is small, a whistling sound during respiration is audible, and last, the deformity of the face in scoliotic noses is not removed.

Demarquay[4] made an incision along the ridge of the nose, separated the mucous membrane from the prominent cartilage, cut the latter off, and united the edges of the mucous membrane, and then the outer wound with good result. Post[5] operated in a similar manner, but obtained access to the nasal cavity by dividing the side of the nose from the cheek. Wagner[6] employs Goodwillie's surgical dental engine, which moves revolving knives, saws, or trocars with a velocity of 2000 to 3000 revolutions per minute, and easily penetrates any desired tissue.

In contrast to these energetic measures is Michel's[7] proposal, who recommends his patients to rectify cartilaginous deviations by digital pressure against the opposite side fifty to one hundred times daily. As this has to be done for quite a long time few patients will be found willing to adopt it. The attempt to destroy the resiliency of the cartilage by a cutting or paring-off process has given rise to another series of operations. Dieffenbach[8] excised either an oval or a wedge-shaped piece of the cartilage, and united the cartilaginous with the membranous septum. Heylen[9] separated the mucous membrane from the cartilage in a patient twenty-one years of age, and cut the latter off with strong scissors. The parts were kept in position by insertion of a probe and strips of adhesive plaster until union was effected. The result was good. Chassaignac[10] operated in a similar manner, but pared off several slices of the redundant cartilage until he could bring it into the right position, and retained the parts in

[1] Rupprecht, L., Wiener Medizinische Wochenschrift, No. 72, 1868.

[2] Goodwillie, D. H., Transactions American Medical Association, 1880, p. 806, also reprint.

[3] Roberts, J. B., Medical News, March 18, 1882, also reprint.

[4] Demarquay, Gazette des Hôpitaux, 1859, p. 470.

[5] Post, A. C., New York Medical Journal, 1884, vol. xxxix. p. 388.

[6] Wagner, C., Diseases of the Nose, New York, Birmingham, 1884, p. 101 *et seq.*

[7] Michel, Die Krankheiten der Nasenhöhle, Berlin, Hirschwald, 1876, p. 29.

[8] Dieffenbach, J. F., die operative Chirurgie, Leipzig, Brockhaus, 1845, vol. i. p. 307.

[9] Heylen, M., Gazette médicale de Paris, 1847, p. 810.

[10] Chassaignac, E., Gazette des Hôpitaux, 1851, p. 420.

place by sponge tampons. Linhart[1] separates the cartilage on both sides from the mucous membrane before removing the deflected part. He lays stress on the complete preservation of the mucous membrane, which, he fears, is in danger to be cut away when the cartilage is denuded on the obstructed side only. Ingalls (*l. c.*) leaves the mucous membrane intact in the wider nostril and makes two incisions from above downward into the deviating cartilage representing an oval-shaped piece, which then is seized by its upper angle, drawn downward, and cut off. He as well as Linhart unites the mucous membrane by stitches. In all these operations the surgeon has to contend with working in a narrow field and with the blood interfering with his view.

Two other operations with the similar object to overcome the resiliency of the cartilage deserve mention. Jarvis[2] employs his snare with transfixion needles without perforating the septum, and Roberts[3] has of late devised an original method by which he makes a long incision through the cartilage in a direction downward and forward with a scalpel, this allowing him to push the whole cartilaginous septum into the median line. He then introduces a steel pin into the nostril, passes it completely through the anterior segment of the divided septum, carries its head to the opposite side and retains it there by imbedding its point deeply in the immovable part of the cartilaginous septum at the back of the naris. If necessary, a second pin will keep the tip of the nose straight.

The removal of the middle turbinated bone of the unobstructed nostril, before operating on the deflection, has been suggested by Delavan (*l. c.*), whilst J. N. Mackenzie (*l. c.*) snared off the lower turbinated on the deflected side with rapid improvement following the restoration of the breathing to its natural channel.

Scoliotic noses, osseous deviations, noses depressed by fracture, are best relieved by Adams's operation.[4] The instruments he uses are a strong forceps with flat parallel blades, a retentive apparatus in form of a steel-screw compressor, ivory plugs, and sometimes a nose-truss. After the bones are broken the compressor is worn three or four days, and then the plugs are inserted for two or more weeks. Modifications and improvements of the instrument were designed by Weir,[5] Jurasz,[6] Capart, the late Elsberg of this city, and others. Weir also relates an original method for straightening depressed and for elongating shortened noses. The blades of Jurasz's forceps are fastened to the handle by screws, and when released

[1] Linhart, W., Compendium der Chirurgischen Operationslehre, Wien. Braumüller, 1862, p. 516.

[2] Jarvis, Wm. C., Archives of Laryngology, 1882, vol. iii. No. 4.

[3] Roberts, J. B., Philadelphia Polyclinic, October 15, 1884.

[4] Adams, Wm., British Medical Journal, October 2, 1875.

[5] Weir, R. F., New York Medical Record, March 13, 1880.

[6] Jurasz, A., Berliner klinische Wochenschrift, No. 4, 1882.

can be left in the nostrils as a retentive apparatus, thereby doing away with the necessity of removing the whole instrument and inserting a compressor. Capart (Brussels) releases the blades by springs, and Elsberg had them made strongly convex at the joint to prevent contusion of the membranous septum. The latter instrument is an excellent retentive apparatus and does not cause sloughing of the septum, a cause of complaint with other compressors, but is too weak to break osseous deviations. Finally an instrument has been published by Steele,[1] which consists of a forceps similar to that of Adams, on the inner surface of one of the blades of which are attached several cutting edges like narrow knife-blades perpendicular to the surface and crossing at a common centre $\frac{1}{8}$ to $\frac{3}{16}$ of an inch in height. The other blade is fused with copper and is introduced in the obstructed nostril opposite the point of greatest deflection. After closure of the instrument the cut edges will override and thus allow of the straightening. The plug he uses afterwards is self-retaining by an acute angle on its anterior corner, which, fitting into a little pocket or sulcus, existing just in front of the outer nasal opening, keeps it from protruding.

This instrument and the original Adams forceps with convexity of the blades near the joint, made for the writer by instrument-makers, Tiemann & Co., have given him the most satisfactory results in the treatment of septal deviations.

[1] Steele, A. J., St. Louis Courier of Medicine, May, 1879.

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